As summer winds down things are still busy here at GEARS.

We are changing the GEARS Tuesday night net. It will be on the GEARS West Repeater 145.410 – PL 123.0 Time will be 7:30. The West repeater should provide better coverage. Check in, We'd love to hear from you every week.

The GEARS UHF repeater at Forrest Ranch is out of service. The 40 year old GE repeater was having sensitivity problems. We have ordered a replacement which should be in service in about a month. We also are working on connecting that repeater to the Win System of over 100 linked repeaters which covers a great deal of the US and many other countries around the world. www.winsystem.org/ Your dues and repeater fund donations allow us to keep the repeaters operating. I'll send out an email when this is active.

This year GEARS will be hosting the Steak Bake Barbecue on Sunday September 10th in Chico. It will be at Wildwood Park in Chico, East Ave & Manzanita, across the traffic circle from fire station #5
We'll light the coals at 11, eat at Noon. GEARS will provide the meat, sodas and plates and utensils. Please bring a side dish to share. Steak $10, Hamburger $5. Please pay in advance paypal paypal.me/w6rhc Please make your reservations by Sep 5th. Call Jim K6EST 530-521-1412 if you have any questions.

We will be having a GEARS equipment auction on Sunday October 1st at the Chico public library. Auction starts at Noon. More details will be provided as we get closer to this event.

The Chico ham radio breakfast will be at 9 am Saturday, September 9th at Farmer's Skillet on Cohasset in Chico.

The general meeting Monday on September 18th is at the Chico Public Library, 1108 Sherman Ave. 6 pm social hour, 7 pm meeting.

Jim Matthews K6EST

September 2023 Calendar

Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1	2
2 8pm OARS Net	4 7pm GARS Net **7pm GEARS Board Meeting** 8pm ARES Net	5 7pm PARS Net 7:30pm GEARS Net 145.410	6	7 6:30 pm PARS meetings 7:30pm Simplex Net	8 7pm OARS meeting 7pm GARS meeting	9 **9am Chico Breakfast**
10 8pm OARS Net **11am Steak Bake BBQ**	11 7pm GARS Net 8pm ARES Net	12 7pm PARS Net 7:30pm GEARS Net 145.410	13	14 7:30pm Simplex Net	15	16
17 8pm OARS Net	18 7pm GARS Net 8pm ARES Net **6pm GEARS Meeting**	19 7pm PARS Net 7:30pm GEARS Net 145.410	20	21 7:30 Simplex Net	22	23 9am OARS Breakfast
24	25 7pm GARS Net 8pm ARES Net	26 7pm PARS Net 7:30pm GEARS Net 145.410	27	28 7:30 Simplex Net	29	30

VEC Testing, FCC License Exam available by appointment. For information or registration call Tom Rider, W6JS 530-514-9211

Chico Breakfast 2nd Saturday 9am Farmers Skillet Cohasset Rd, Chico

GEARS Board Meeting 1st Monday 7pm by Google video meetups.

PARS Meeting 2nd Thursday 6:30pm, doors open 6pm Old Magalia Community Resource Center

OARS Meeting Second Friday of the month, St. Pauls Episcopal Church Hall, Oroville.

GARS Meeting Second Friday of the month, Lutheran Church Hall, Artois.

GEARS Meeting, Doors open 6pm, meeting 7pm at Chico Public Library, 1108 Sherman Ave, Chico

OARS Breakfast 4th Saturday of the month, at Cornucopia of Oroville.

NETS:
OARS Club Net Sunday 8pm 146.655 Mhz - PL 136.5
GARS Club Net Monday,7:00 pm 147.105 MHz + PL 110.09, secondary: 146.850 MHz-PL 110.9
Yuba Sutter Club Net Monday 7pm 146.085 MHz + PL 127.3
GEARS Club Net Tuesdays 7:30 PM 145.410 – PL 123.0
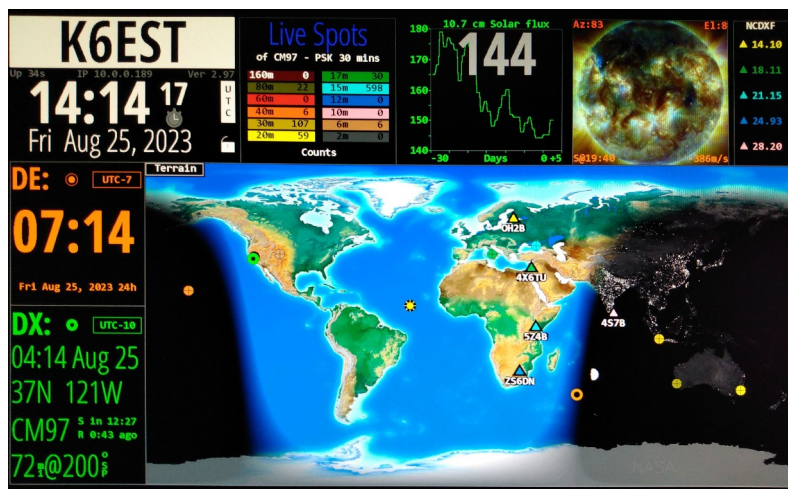PARS Club Net Tuesday 7pm 145.290 - PL 110.9
Simplex Net Thursday 7:30 p.m. 146.52 no tone
Yuba Sutter ARES Net Thursdays 7pm 146.085 MHz + PL 127.3
Sacramento Valley Traffic Net Nightly 9:00 PM 146.850 MHz - PL 110.9

For those of you who have wanted a Hamclock but didn't want to spend a lot of time or money for it, you have got to check out the $39 Inovato Quadra mini computer. It comes preloaded with linux and a bunch of ham software including hamclock. $35 includes power supply and Hdmi cable. You'll need a mouse, keyboard and Hdmi monitor. You can either use an ethernet cable to your router or WiFi.   I just purchased one. Easy to set up and use.
https://inovato.com/products/quadra

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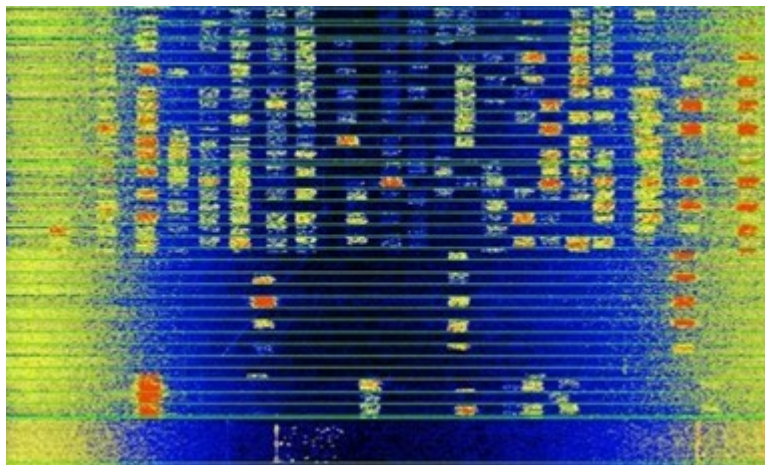
FT8: Choosing a Radio and Interface

by Mark Haverstock, K8MSH

So you want to get into FT8: What's the best way to proceed and what equipment is required?

To use FT8 you need four things:
1) HF transceiver with data or SSB capability
2) Audio interface
3) A way to get receive audio from the radio into a computer and audio output of the computer into the radio, typically a sound card interface
4) A computer capable of running the FT8 software and time synchronization

First you need to consider your radio. Of course, they will all work if they have the frequency capability, but what else will you need? To operate FT8, you will need a sound card interface. There are multiple ways to accomplish this. Some radios have this feature built in, needing only a USB cable from the radio to the computer.

ICOM has been really good about building that capability into its products. I use the IC-7100 as a base station. It is remarkably easy and efficient at digital modes.

The IC-7300 is another popular option for FT8 operation without extra accessories.

If you don't have a radio with built-in USB function, you'll need a sound card. One of the most popular options is the SignaLink USB Digital Communications Interface from Tigertronics.

With specific jumpers inside and matching specific cables outside, the SignaLink USB can be adapted to any radio for data use. It combines the legendary performance of the SignaLink SL-1+ with a state-of-the art built-in low-noise sound card. The SignaLink USB has only one USB connection to the computer, and in most cases, only one connection to the radio. Convenient front panel controls make setup and operation

easy. Plus, it's fully isolated and compatible with all radio Mic, Data, and Accessory Ports, and supports virtually all sound card Digital and Voice modes. Combos that include the SignaLink unit and radio-specific interface cable are also available.

There are many other interface options that can work as well. It will depend on your radio type and setup.

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Ham Radio 101: Modes

By Mark Haverstock, K8MSH

What's a "mode"? The term really has two meanings in ham radio, and the definitions overlap somewhat. An operating mode is a description of what you are doing to send and receive signals. For example, the term phone refers to using your voice on the radio.

Modulation mode refers to the specific method by which information is sent over the air, such as SSB, FM, and AM.

An operating mode may be performed with one or more individual modulation modes. Here's a chart that shows some of the relationships:

If you look closely, you'll see some examples of the overlap. DMR is both a phone and digital modulation mode. Likewise, you can use a computer to send and decode CW digitally.

Operating Mode	Modulation Mode
Phone	SSB, AM, FM, Digital Phone (D-STAR, DMR, System Fusion)
Digital	RTTY, PSK31, FT8, JT65, Packet (and many more)
CW	CW, Computer CW

It's possible to use any modulation mode on any band or frequency. However, different modes work better on different bands. For example, FM takes up a significant amount of space in the radio spectrum. That's why it's located on 10 meters and above where there's lots of room.

But wait a minute—aren't there AM and FM frequency bands? Well, these are also generic names for the radio AM frequency band of 530-1700KHz and FM frequency band 88-108MHz. They're identified by the mode of broadcast signals transmitted there.

Let's look at the modulation modes available on an HF radio. Press the mode button on the screen of an Icom IC-7300 and you see the following modes listed:
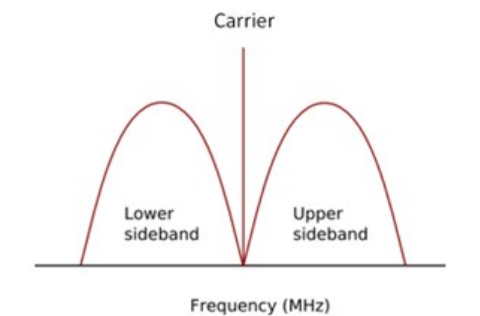
AM (Amplitude Modulation) is the oldest form of voice modulation. When you speak into the microphone of an AM transmitter, the microphone converts your voice into a varying voltage. Amplitude modulation adds this to the carrier, with three separate

frequencies being transmitted: the original carrier frequency, a lower sideband (LSB) below the carrier frequency, and an upper sideband (USB) above the carrier frequency. It's still used by a small group of amateurs, but most ham voice activity on HF has moved to SSB.

SSB (Single Sideband) is a descendant of traditional AM. Compared to AM, SSB is a much more efficient mode since all of the transmitter's power goes into transmitting useful intelligence. In SSB transmitters, the carrier and one sideband are removed before the signal is amplified. This means an SSB signal only occupies about half the frequency space of a comparable AM signal, allowing more activity on the ham bands.

There are two sidebands, USB (upper) and LSB (lower). On the HF bands above 9 MHz, the voice operation takes place using USB. Below 9 MHz, you find everyone on LSB, except on 60 meters. By putting all of the power into one sideband, the effect on the signal-to-noise ratio is a four-fold (or 6 dB) improvement.

FM (Frequency Modulation) is the mode of choice for local VHF/UHF operations, fixed or mobile, simplex or repeater based. The audio signal modulates the frequency of the transmitter over a small range. It offers good performance with simple equipment requirements. The big advantage of FM is its audio quality and immunity to noise, but it occupies more frequency space than AM or SSB.

CW (Continuous Wave) is the oldest mode of wireless transmission, the simplest, and one of the most efficient. It consists of just turning an unmodulated carrier on and off in a coded pattern that represents characters–the International Morse Code. Technically, it's a digital mode.

Radioteletype (RTTY) has been in use longer than any other digital mode except for Morse code. It involves shifting of the carrier between the mark and space to generate characters in the Baudot code, a more elaborate version of Morse code. At the receiver, the Baudot signals originally produced the decoded text on printers. Now radio displays or computer screens are used.

DATA (Digital Modulation) is becoming a popular mode among radio amateurs. The main methods used to modulate digital signals are amplitude shift keying (ASK), frequency shift keying (FSK), and phase shift keying (PSK). Sounds really technical, but it still boils down to basic binary where each shift is a transition from 0 to 1 and 1 to 0–or on/off.

Transceivers will continue to feature more options as technology continues to improve. If you have an older transceiver, you can operate digital modes by adding sound card interfaces like the Tigertronics SignaLink USB Interface Unit or the RigExpert TI-3000 Digital Mode and Radio Control Interface. Many current transceivers are capable of using both computer control and dedicated data modes. Transceivers with built-in sound cards eliminate the need for an external interface. Either way, you can take advantage of current and new digital modes.

RTTY is a good example of a mode now incorporated into current transceivers. Modern radios like the Icom IC-7300, Yaesu FTDX10, or Kenwood TS-890S can decode through the receiver and send using message memory or a computer. The TS-890S provides the additional option of typing on the fly with a USB keyboard–no computer needed.

Modern digital modes such as FT8 have gained worldwide popularity and account for a large portion of all ham radio activity on the HF bands. It's a frequency shift keying, digital weak-signal mode used mostly on the HF bands. Using advanced signal processing technology, FT8 can decode signals with a low signal-to-noise ratio much better than CW or SSB. FT4, a variant of FT8, is also gaining a large following and is designed specifically for radio contesting.

What's Next?

It appears the future of amateur radio modes will continue to be built on software and supported by computers, as well as new generations of full-featured transceivers. These combinations continue to fundamentally change many of the modes we'll use to make radio contacts. Hardware retrofits and specialized interfaces are becoming a thing of the past.

GEARS CENTURY MEMBERS

Michael Ellithorp   Kent Hastings
Bennett Laskey   Jim Van Sickle
Stephen McDermott
We thank these members for their extra support.

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Your dues and contributions support our local repeaters, ARES, Field Day and outreach events to keep amateur radio alive in our area. GEARS also makes donations to support other local repeaters and clubs.

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